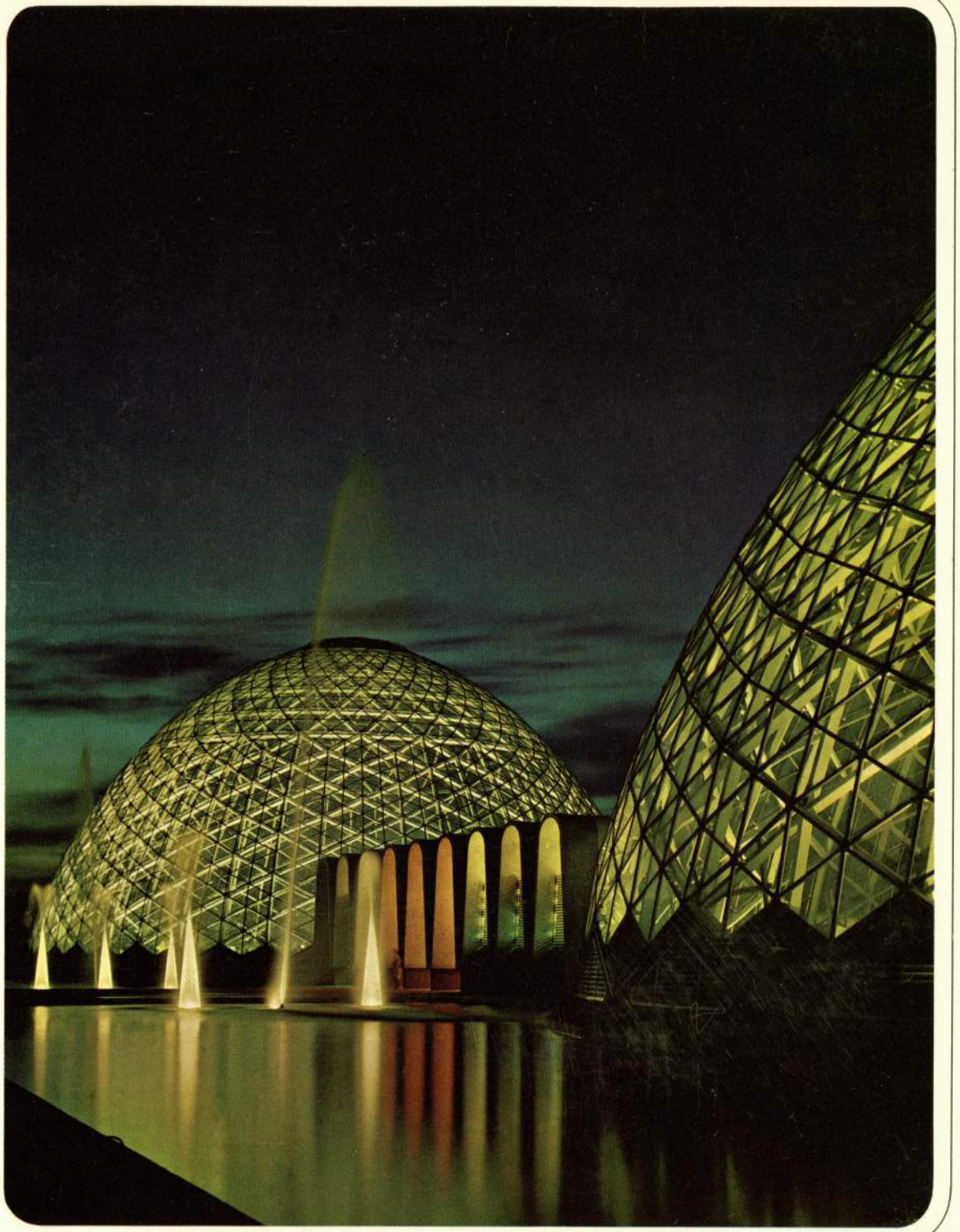
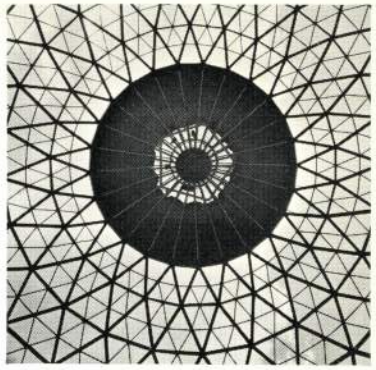
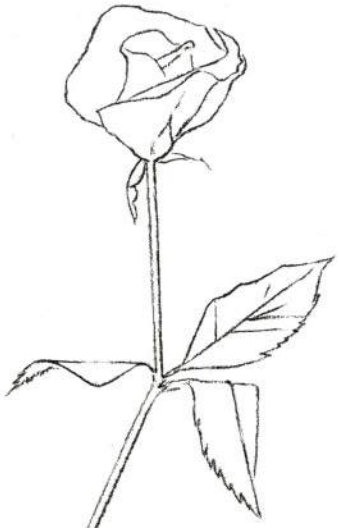
MILWAUKEE COUNTY / MITCHELL PARK

HORTICULTURAL CONSERVATORY







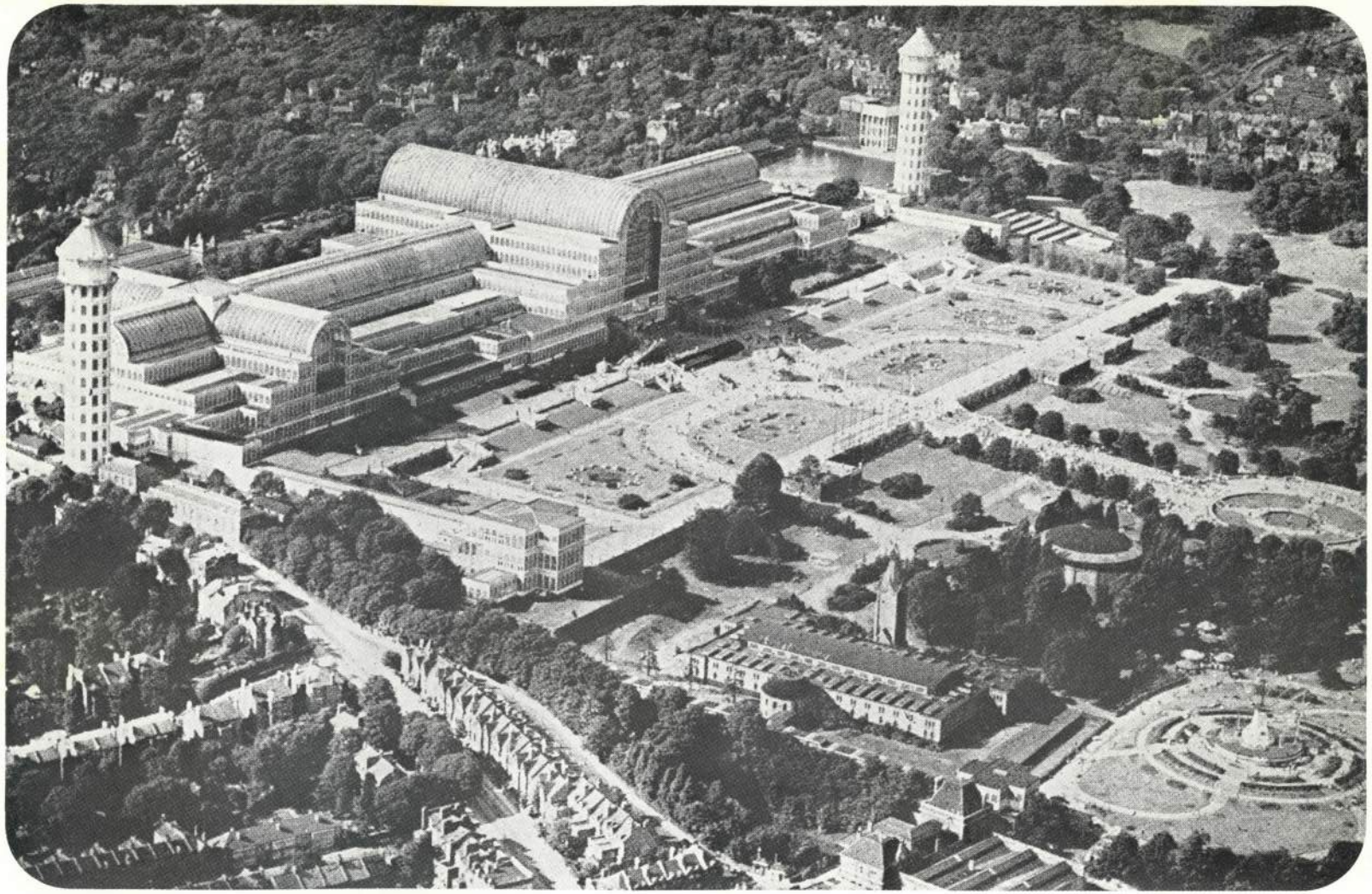
MILWAUKEE COUNTY / MITCHELL PARK

HORTICULTURAL CONSERVATORY

To more than a million residents, and to hundreds of thousands of others, the park system of Milwaukee County offers varied opportunities for recreation and relaxation ■ Perhaps no attraction is more excitingly satisfying than the Mitchell Park Horticultural Conservatory . . . the only one of its kind in all the world ■ How the dream of a group of dedicated public-minded citizens came to be, how it took form and shape, and how it works . . . all is told here in words and pictures. The brochure has been produced for the enjoyment of all who love the beauty that this Conservatory contributes to so many in today's intense and often anxious living.

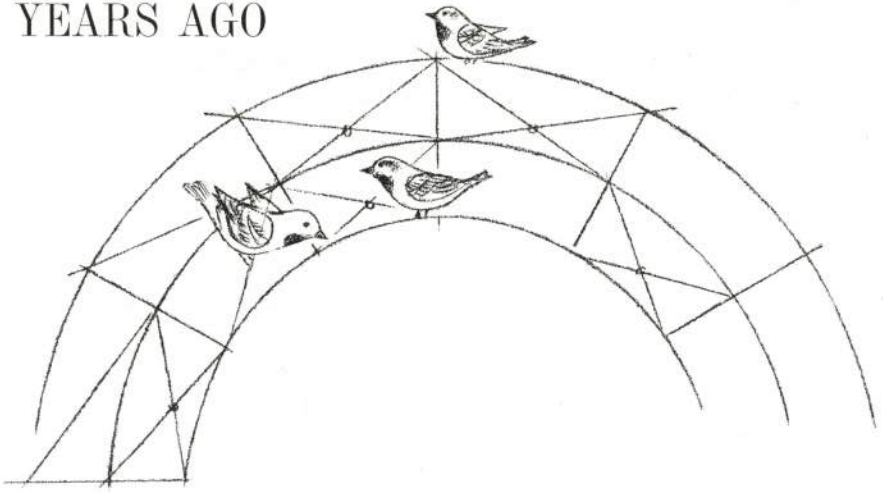
MILWAUKEE COUNTY PARK COMMISSION
901 North Ninth Street • Milwaukee, Wisconsin 53233
Mitchell Park Horticultural Conservatory
550 South Layton Boulevard, Milwaukee, Wisconsin 53215

Price $1.00



Joseph Paxton's Crystal Palace —
a marvel of his age — built in 1851
as a Conservatory near London.
Many of Paxton's basic ideas
were applied to the Mitchell Park domes.

THE BASIC IDEA STARTED MORE THAN A HUNDRED YEARS AGO



Tending the gardens of the Duke of Somerset at Wimbledon (near London) was a genius named Joseph Paxton, who was born in 1801. The gardener soon turned into a designer-builder, erecting experimental houses of glass at Chatsworth.

In 1836 he developed his curvilinear "Great Conservatory," using sheets of glass ten inches wide and four feet long. Because of his advanced engineering ideas, the Great Conservatory lasted 80 years.

Commissioned to design the Great Exhibition Building, called the Crystal Palace, Paxton submitted such revolutionary sketches that voices rose in protest: "It will fall down of its own accord" . . . "The wind will flatten it" . . . "It will leak like a sieve" . . . "It will roast the spectators in summer!" (Similar remarks were made 106 years later when sketches were submitted for the Mitchell Park Conservatory.)

Built in 1851, the Crystal Palace covered 21 acres of land, cost more than $7 million, and resulted in knighthood for Paxton. More than *three hundred thousand* panes of 1 foot by 4 foot glass were used.

Many of Sir Joseph Paxton's basic ideas were applied to the Mitchell Park Conservatory. One solution to a problem of the Crystal Palace, however, has not been necessary in Milwaukee. In March, just before the grand opening of the Crystal Palace, thousands of sparrows flocked inside where the temperature was temptingly warm. This naturally caused trouble. Plant exhibits, sculptured masterpieces, and hundreds of frantic workmen were constantly showered with droppings from the nesting birds. The show was about to open, and not even Joe Paxton could solve the problem. In desperation the Queen was informed. She immediately sent for the Duke of Wellington, trouble-shooter for England in much darker hours than this. The Duke visited the Crystal Palace, took one look at the situation, snapped, "Get some sparrow hawks!"

Conservatories all over the world were patterned after the Crystal Palace. Ventilation, design, heat, angles of the glass, basic construction — all Paxton's ideas were repeated year after year without major change. (Exceptions are the small Forest Park Conservatory and the Climatron in St. Louis. The latter is a Buckminster Fuller geodesic dome built in 1961. It is 200 feet in diameter.)

And although Sir Joseph deserves credit for many of the design principles used in the Mitchell Park Conservatory, it can be truthfully said that these three great domes represent the first major innovation in Conservatory design in two and a half centuries.

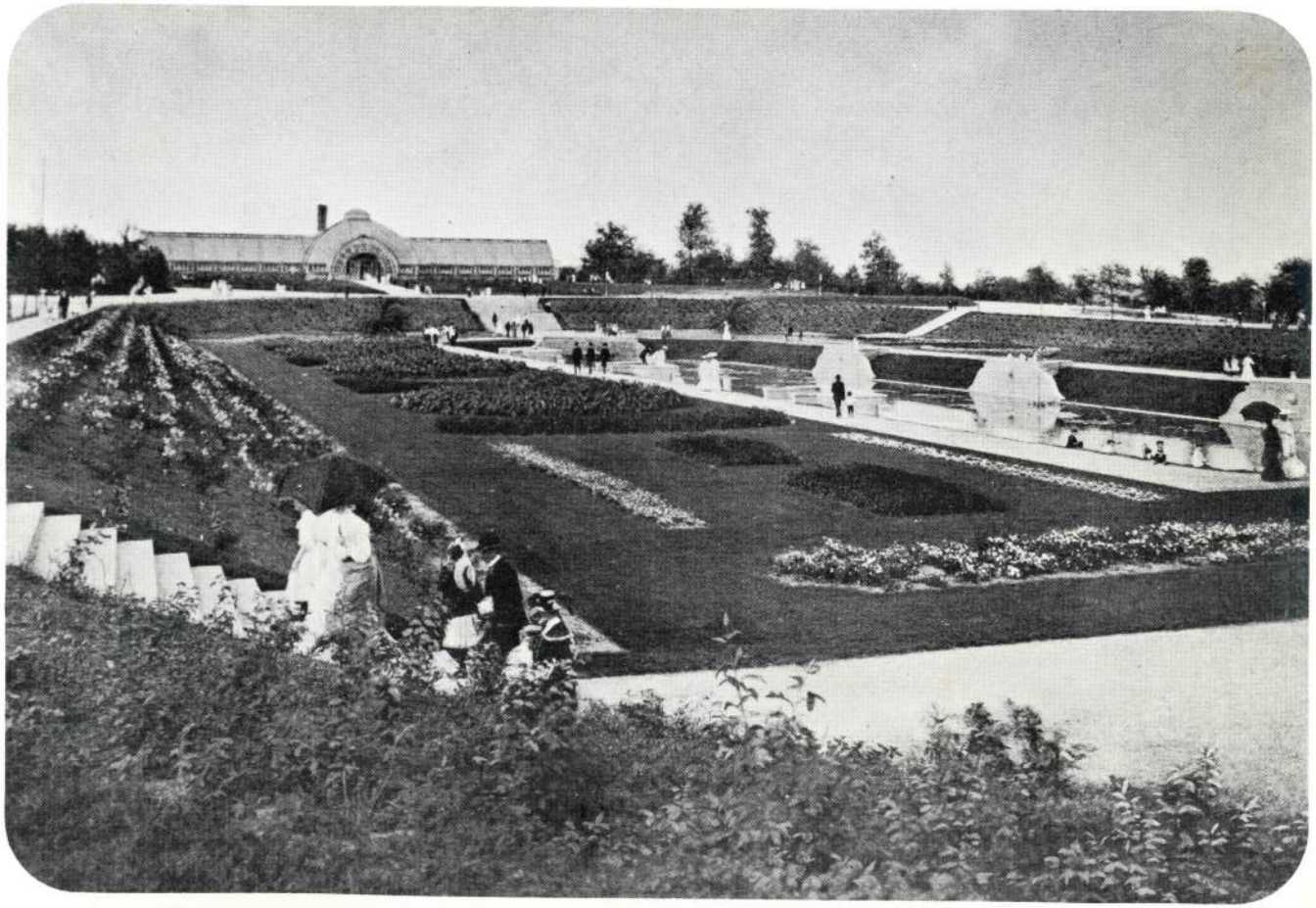
IN MILWAUKEE COUNTY THE BEGINNING WAS IN 1889

Today's bold tri-dome complex reflects in the water mirror of yesterday — an inspiring tribute to scores of publicly dedicated Milwaukee County citizens who began their wise planning before our twentieth century began.

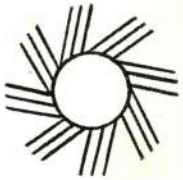
On June 18, 1889, the first City of Milwaukee Board of Park Commissioners held an historic meeting to buy land for a public park system. One of the first purchases was a 24½ acre plot of land from John L. Mitchell (later U.S. Senator). Two years later Mr. Mitchell presented the city with a gift of 5.29 acres. In 1900 another 28½ acres were bought from the estate of John Burnham. And in 1906 came a deed from the Milwaukee Southern Railway Company of additional land to complete the 63⅓ acres of today's Mitchell Park.

Growth of the infant was rapid. In 1898 a conservatory and greenhouses were built. In 1904 the lovely flower garden and water mirror, popularly known as the Sunken Garden, was completed, followed by additional greenhouses in 1906. In 1937 electric lighting brought to thousands the beauties of the Conservatory and Sunken Garden after daylight had faded.

The 57-year-old Conservatory, which had served so many so faithfully, was no longer adequate for the population of 1955, and was razed that year to be replaced by today's magnificent structures.



The Conservatory, garden, and water mirror, revered by an average yearly attendance of 350,000 in the first half of this century, as it was in 1904.



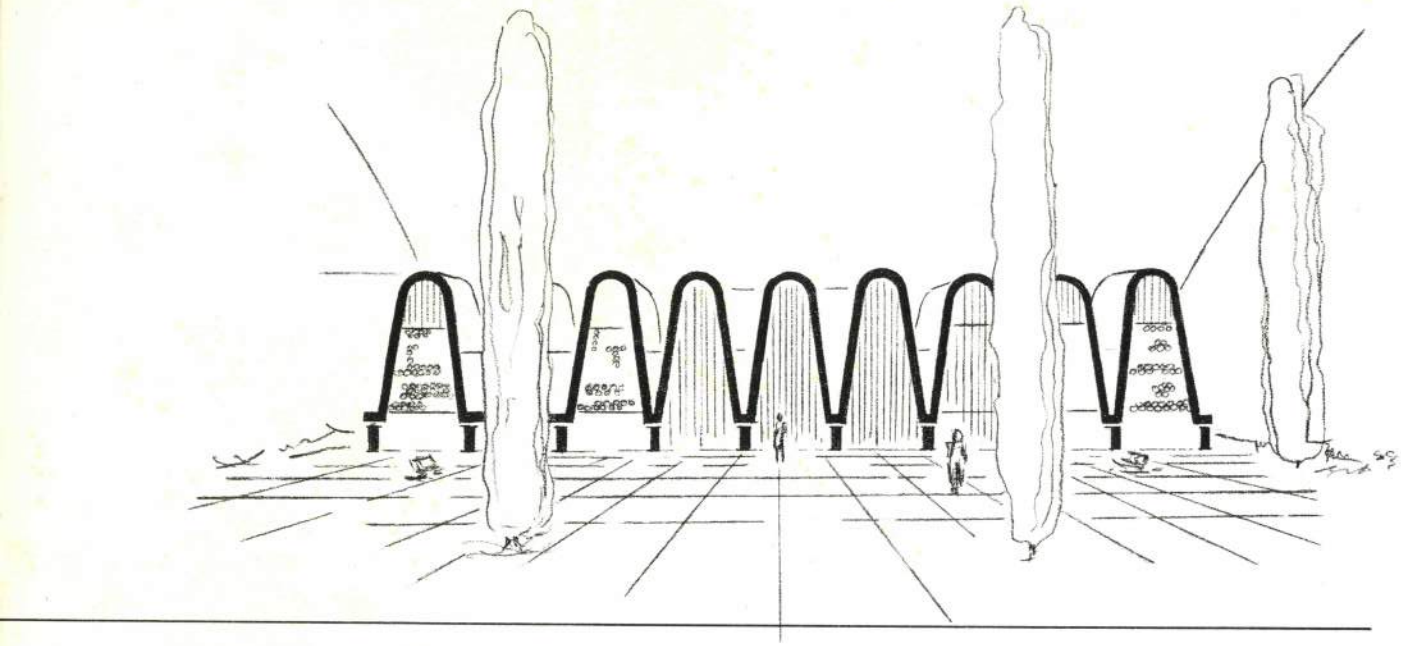
THEN, IN 1955, A SET OF BOLD NEW OBJECTIVES

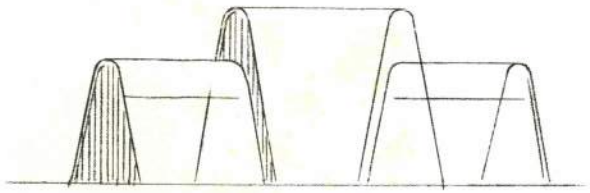
The only horticultural structure of its kind in all the world, Mitchell Park's new Conservatory is the culmination of the courage, imagination, and dedicated activities of many civic-minded men and women. Included were the efforts of the Milwaukee County Board of Supervisors, and the Milwaukee County Park Commission.

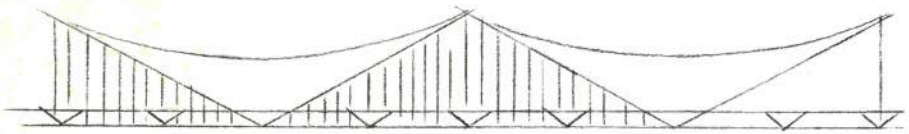
After the razing of the old Conservatory in 1955, objectives of County Park System General Manager Howard Gregg, and Horticultural Director Howard E. Brossman were defined: "Let us provide for the public the ultimate in experiencing nature in the city," they said. "Plant life of many kinds must be sustained throughout all seasons. There must be adequate space — including enough height so that such giants as Royal Palm trees can mature to their majestic 70 feet. Let us have control of the heat, moisture, ventilation, and sun rays required to conserve exotic plant materials in an ecological setting for future generations.

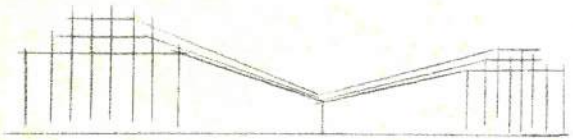
"We want people who may never have the chance to travel, to see a representative world-wide variety of plants — even if separate climates are required for different types. We must have facilities for replacing plants — even when the temperature outdoors is 20 below. And we insist on an efficient complex which can be operated economically."

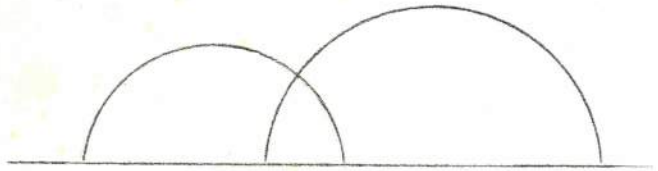
Those were just some of the goals. That they have all been accomplished is almost a modern miracle. How the objectives were met, how the structures were built, and how they operate, is told in the pages that follow.











THE DESIGN CONCEPT: TRIAL, ERROR, AND SOLUTION

Hundreds of individuals, scores of groups, and a few key companies combined their talents and knowledge and facilities to make possible the new Mitchell Park Conservatory.

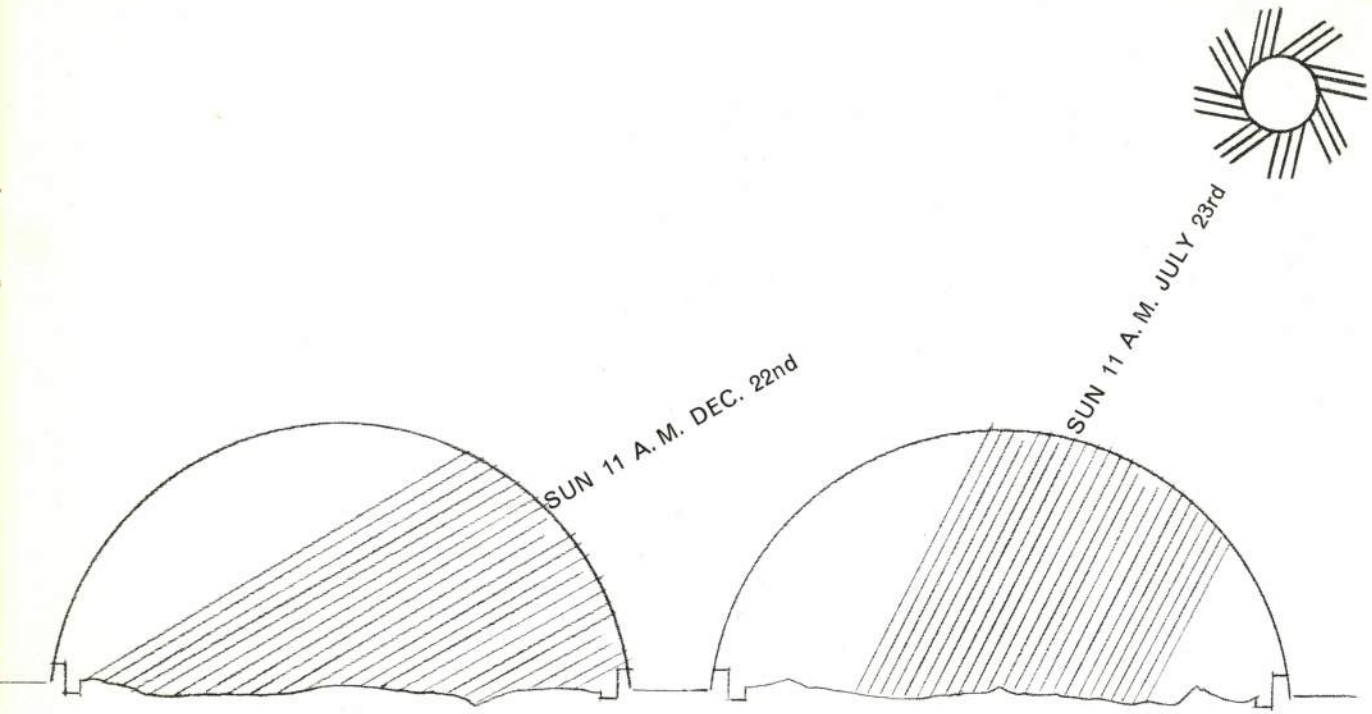
Some of them outlined the objectives. Others did the planning. And still others executed the plans. With a project so vast in scope, it is difficult to say who made the most important contributions. In a sense, they all did!

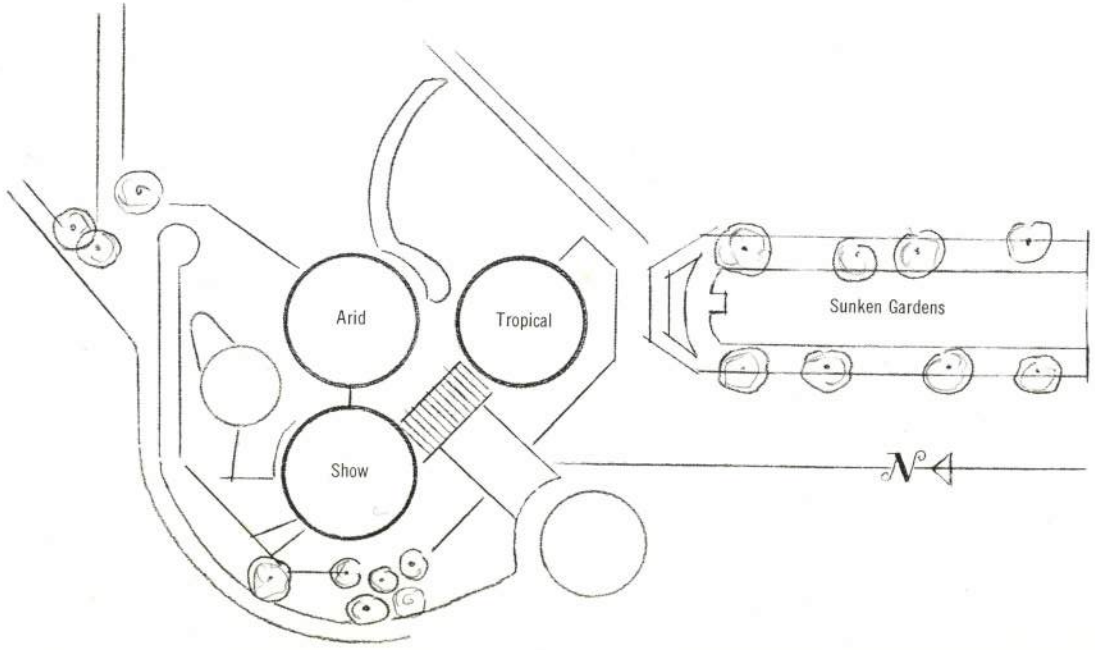
Once the aims were defined, an architect had to be commissioned. *Thirty-three were interviewed.* The man whose ideas were the most non-conforming of all was the same man who had done the most studying of traditional conservatories. Donald L. Grieb suggested an *ecological* approach — a housing plan to be determined by the relationship of organisms to their environment. This was totally different from the old conservatory plans using various greenhouses: one for roses, one for ferns, another for palms, etc. In the summer of 1958, Architect Grieb was commissioned for the challenging assignment.

He came to the committee meetings armed with exciting ideas about dome shapes, new materials such as concrete structures so thin they would permit the spaciousness and light required. He stressed the need of an overall plan to include future building as well as present — all within the framework of the limited size of Mitchell Park, and in relationship to its existing features such as the Sunken Garden.

The bold new concept included, in the master plan, *four* domes. Three will recreate the three climatic conditions of the world: arid, tropical, and temperate. (Completed are the arid and tropical domes, plus the "show" dome. The temperate dome is to be the fourth.)

The concept also required critical spacing of the domes. Each would be located so that the light and shadow of one would not interfere with light and shadow areas of the others. And although different in usage, the four would be uniform in structure, with separate controls for the individual climates man desired to create in each.





STRATEGIC SITES FOR THE FOUR DOMES

In the master plan the Tropical House was placed directly on an axis with the Sunken Garden.

The Show House was spotted on an oblique angle west of the Tropical House, on the opposite side of the lobby.

The Arid House was placed directly behind the lobby.

And the fourth dome (to be called the Temperate Climate House) was to be slightly to the east of the Arid House.

Each location was selected only after studies of sun and shadow conditions were made in every season to assure optimum results for the different climate requirements of the four "houses."

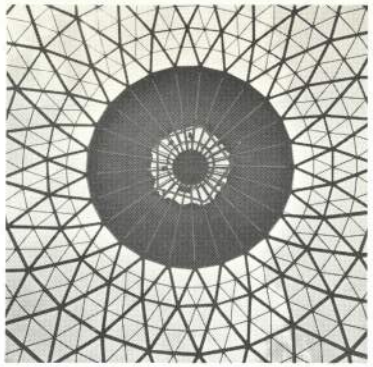
WHAT SHAPE DOME? NEW OR OLD? TESTED OR UNTRIED?

In the early days of the new Mitchell Park Complex, geodesic (hemispherical) shapes were considered. Botanists throughout the country approved of them. Designer Buckminster Fuller had already used them, though for other purposes.

Architect Grieb's research and design development, however, suggested that another form be found. A hemisphere 140 feet across at the base, a dimension set by site planning, would be only 70 feet at its highest point — too low for maturing plants. Moreover, a hemisphere's relatively flat top could permit Milwaukee's heavy snows to accumulate, blocking light and catching dirt.

Lastly, minimum refraction of the sun's life-giving rays at Milwaukee's latitude of approximately 43 degrees North, where the sun seasonally moves many degrees up and down between the southern horizon and the zenith, indicated a changing curve from the ground up instead of the constant one found in a hemisphere.

For such functional reasons, and as a strong design preference, Mr. Grieb chose the "bee-hive" form rising at the center to a height of 87 feet. Technically referred to as a complex cone or conoid, his solution was unique. No such conservatory has ever before been designed.



In the original concept, plans called for a structure that would allow 80% of natural light to enter. This obviously meant a maximum solid structure of 20%. The problem: how could the strength of a relatively fragile "egg" be attained in a clearspan building 140 feet in diameter and about 85 feet high?

THE EXPERIMENTAL MINIATURE SCOTCH-TAPED TOGETHER

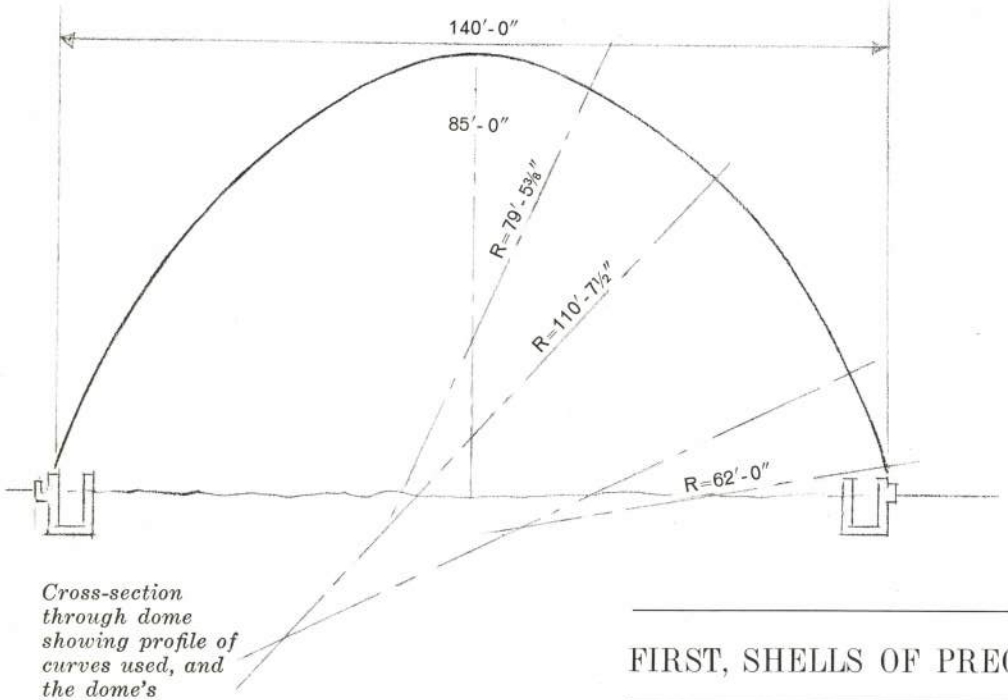
To determine how to build the complex conoids, an 18″ diameter bubble of plastic was made. Thousands of pieces of paper were cut and scotch-taped to the bubble to ascertain shapes and sizes of the skin covering. So many odd sizes resulted that no practical solution seemed possible.

Glass weights and uniform sizes were studied, and found to be a sound basic for size determination. Reinforced concrete was selected for a weblike framework to be covered by a skin of glass and aluminum. Architect Grieb awoke in the middle of a night with an idea for a geometric flower-like pattern in the form of a dome. This pattern, sketched on paper that night, created the basis for three geometric forms: hexagonals, diamonds, and triangles. Cast of reinforced concrete, the three hexagons, two diamonds, and one triangle made up a section not unlike an orange-peel in shape; and 25 of these sections or segments completed the conoidal form.

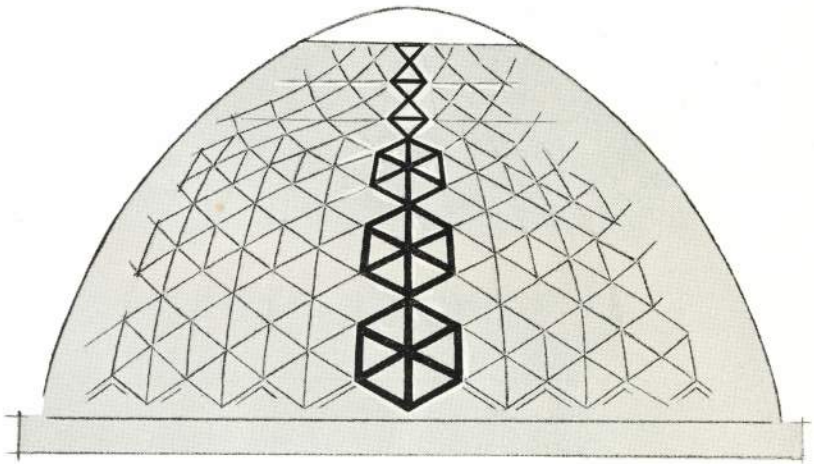
"The repetition of this simple grouping of elements is one of the major design features that helps to create an economical and structural beauty — the homogeneous pattern of light and shade of which we are so proud and happy," said Donald Grieb. (The idea was patented July 6, 1965.)

Thus was the conoidal format conceived. And thus was the structural skin of the great domes planned. Now came the details of exactly what materials to use, and how to put them together to accomplish all the goals demanded of the project.

THE GREAT DREAM TAKES FORM



Cross-section through dome showing profile of curves used, and the dome's dimensions.



The six basic geometric shapes comprising one section of a dome.

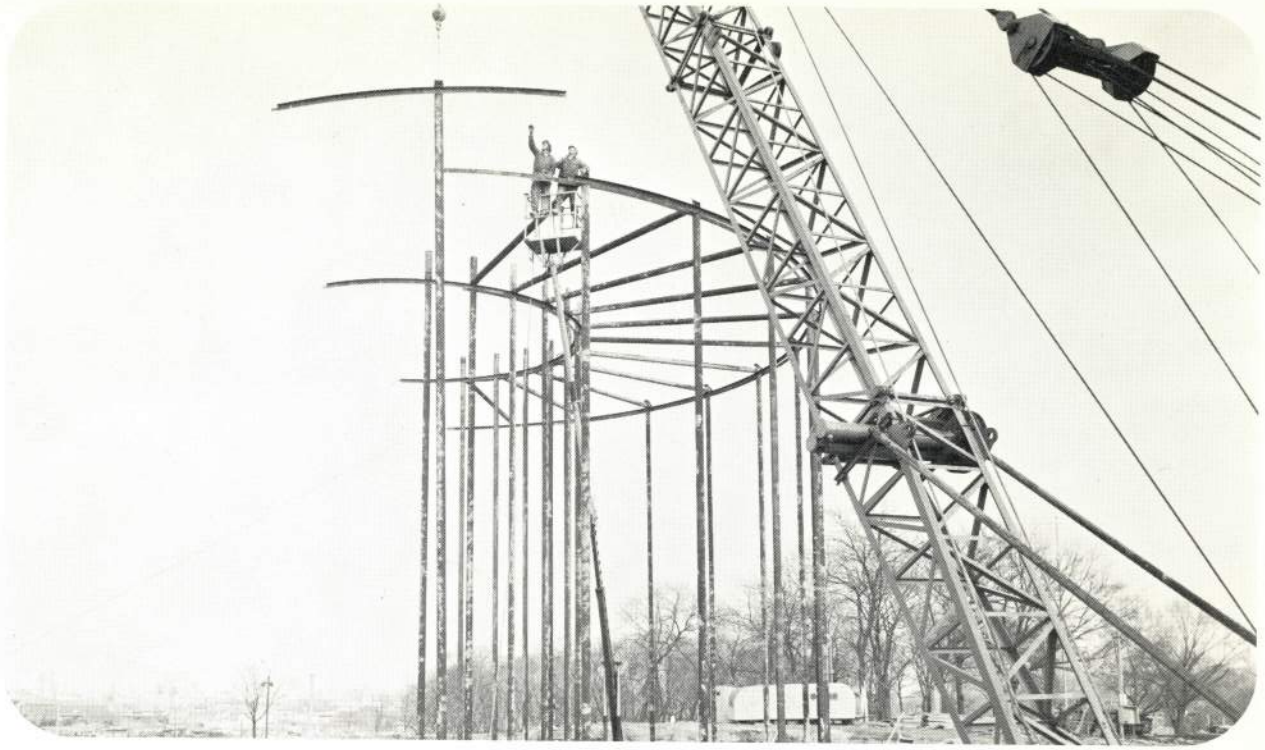
FIRST, SHELLS OF PRECAST CONCRETE

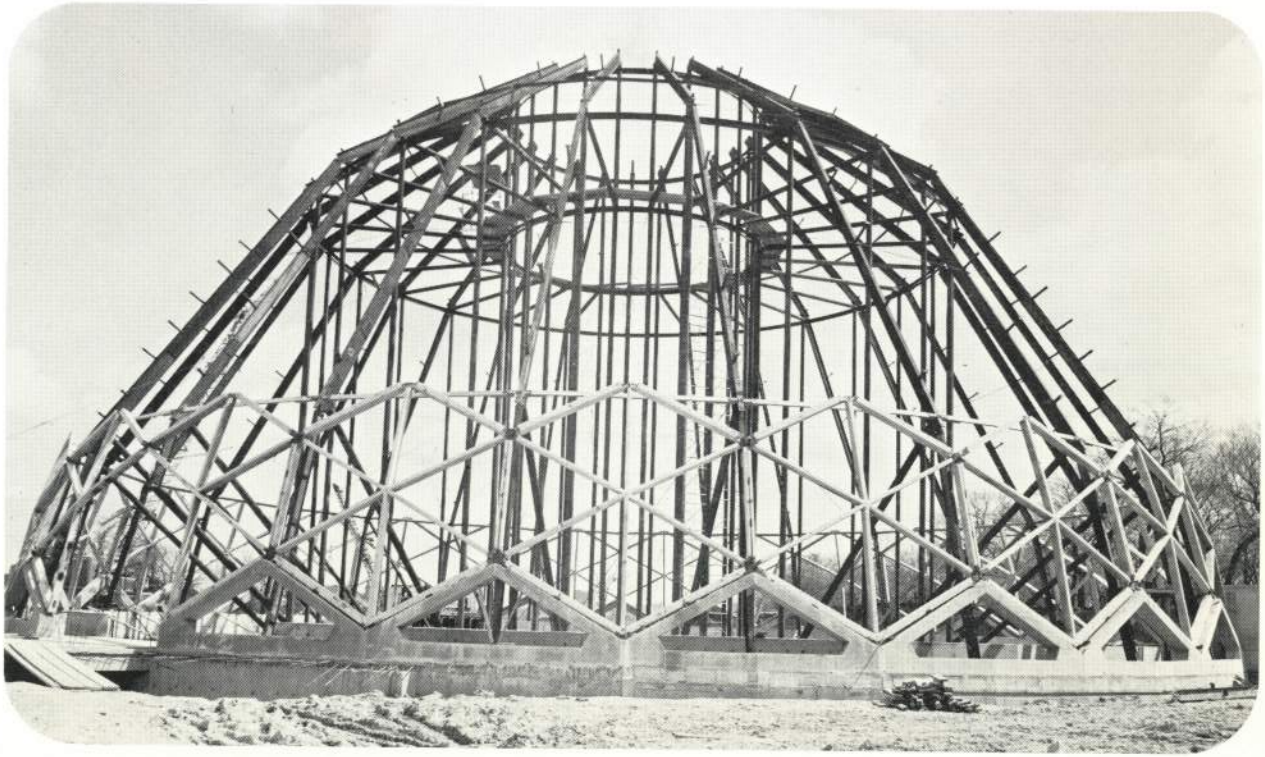
Concrete was selected for the dome framework for several reasons. It is the only structural material that can be economically formed to almost any desired shape. It would resist attacks of moisture and insecticides inside the finished structures. And, it could be precast.

The largest pieces of concrete (nearly 18 feet across) were not formed in one plane, but had a two-directional configuration. As a result, the problems of casting the units were tremendously complex, but were solved by President W. John Hufschmidt and engineers of Hufschmidt Engineering Company.

Molds were made of concrete from master patterns of plaster of paris, to insure the dimensional accuracy of close fitting units. Some of the prefab concrete sections are only 2⅞ inches thick — yet they passed all requirements including compressive strength tests (not less than 5,000 pounds per square inch in 28 days of curing time). *All* pieces of concrete were tested for strength daily at the site.

Structural design was provided by the architect, who retained as consultants the firm of Ammann & Whitney, Inc. Mr. Grieb and the late Mr. Charles Whitney developed the structural frame. Detailing, forming, precasting, and erecting were executed by Hufschmidt Engineering Company from contract drawings and specifications prepared by the architect.





REMOVABLE FALSEWORK

Because the 225 precast concrete units in a dome depended upon each other for structural support, much as the stones in an arch, Hufschmidt Engineering Company had to design and construct a 100-ton temporary steel structure, called a "falsework," to hold the pieces together until the "key stone" units were in place. This falsework, which rested on independent concrete footings, was then disassembled and removed from inside the dome for construction again at the next dome.

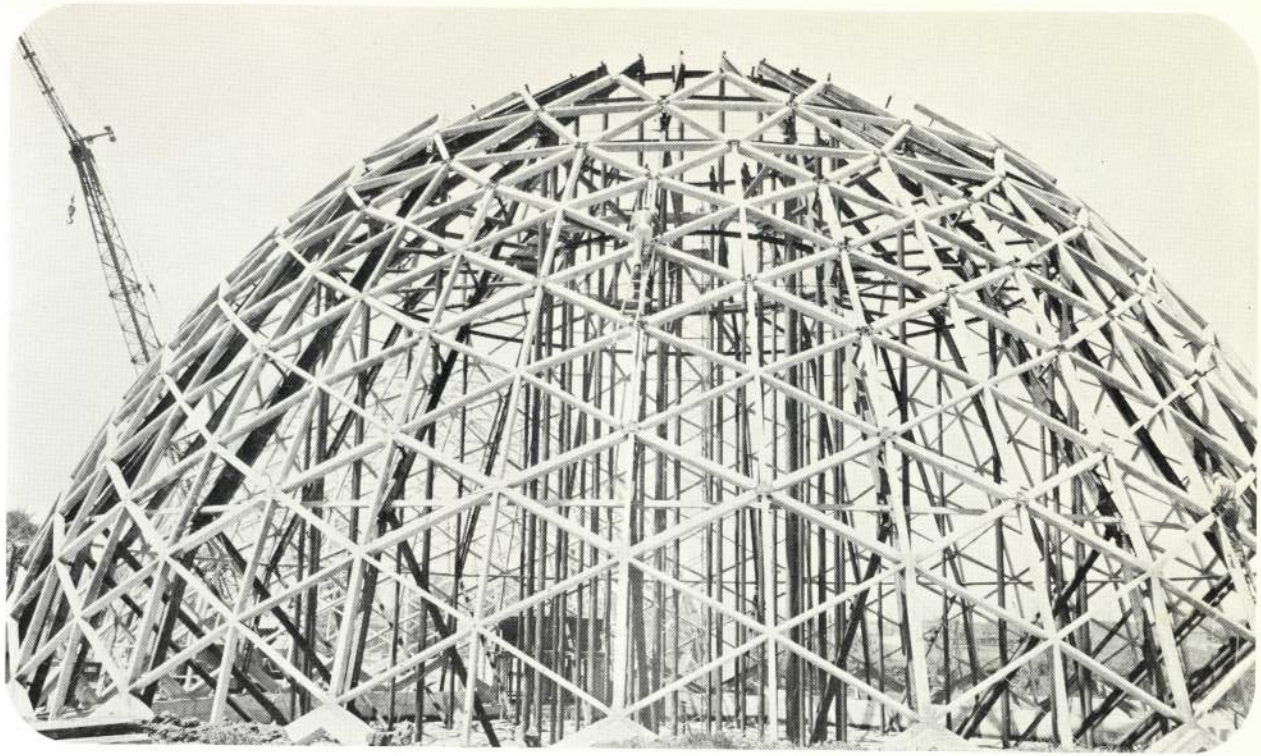
All measurements to form the shape of the domes were made from a single center point on the floor — for *each* of the 225 units of concrete in each dome.

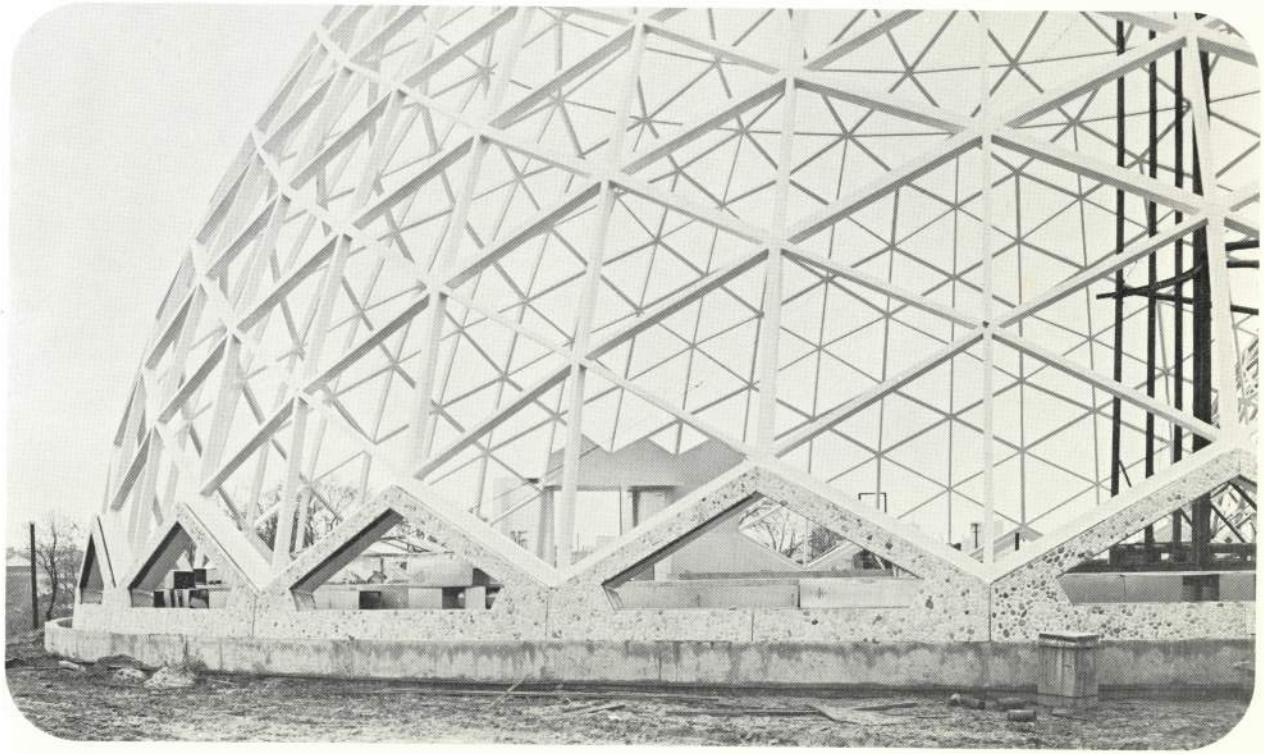
Erection of the "falsework" — temporary structure used for applying the precast concrete sections. All falsework was removed after concrete sections were in place.

Completed falsework with first "ring" of largest size precast concrete sections in place.

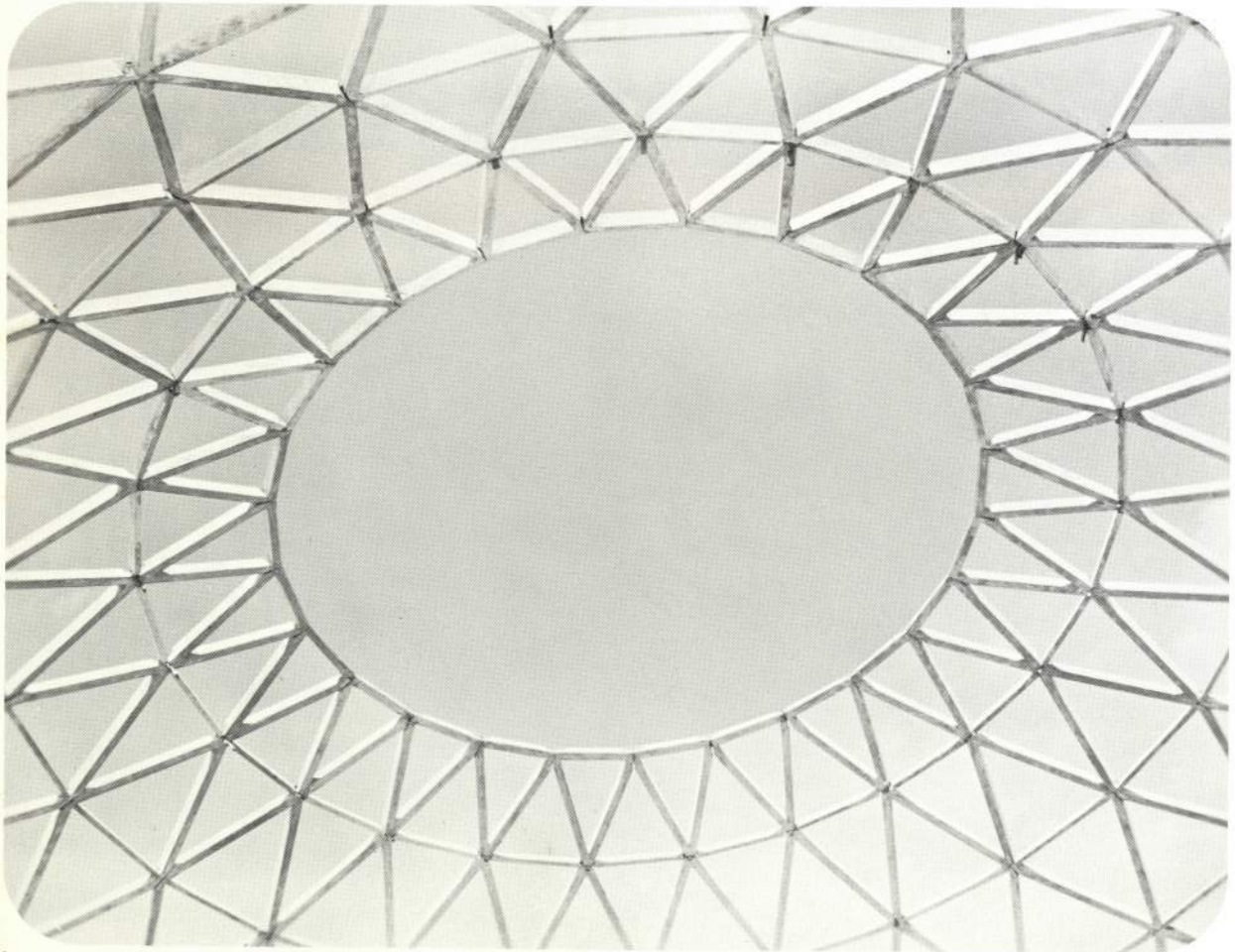
Almost all rings of precast sections in place. Note apex is open.

Close-up of dome with temporary supports of the falsework almost removed. Small stones in base are Lake Michigan beach stone "skippers" selected for color and size.





As airy and delicate as old lace
— yet superbly designed
to safely self-support the load
of glass and aluminum to come.



The two photos above show how
the beautiful entry arches were site-cast
and erected. Poured on the ground,
of exposed aggregate precast concrete,
they were lifted into position in halves.
Each arch is 24 feet high,
covered on the inside with foam insulation
and plaster, surfaced on the outside
with a quartz-like stone, and
roofed with a sprayed-on material.

NEXT, A FANTASTIC "SKIN" OF GLASS AND ALUMINUM

The photos that follow illustrate the planning and execution of applying the covering of glass and aluminum extrusions which form the required overall sky of glass for each dome.

Super Sky Products, Inc. of Thiensville, Wisconsin, designed, fabricated, and erected the entire skylight system of the three domes. President Walter A. Belau and his associates at Super Sky Products spent approximately three years designing this unique system to the architect's specifications.

For perfect lineup of the pre-glazed units, operator marks steel inserts of the precast concrete frame with center punch to indicate the center lines of each of the spherical joints.

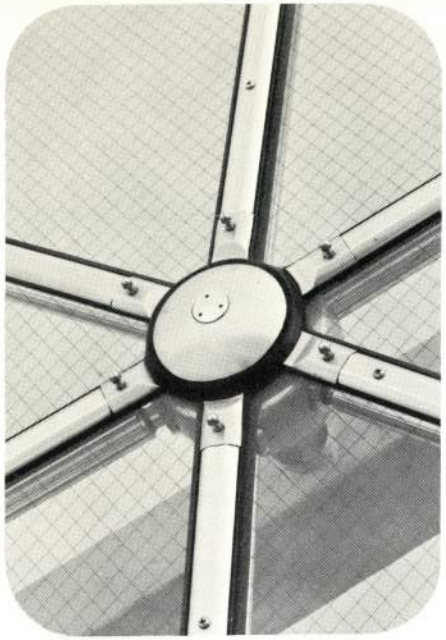
Assembling the pre-glazed unit on the job in the shed constructed for that purpose.

Hauling a pre-glazed unit to crane for erection on dome. Note in the background that many of the units are already in position.

Pre-glazed unit is now lifted by crane into position on the concrete framework.

Crew eases unit into position on the punched marks. Note steel plates set in precast concrete shell.

Arc-welding stainless steel supports of the glazed unit onto the steel plate embedded in the concrete framework.

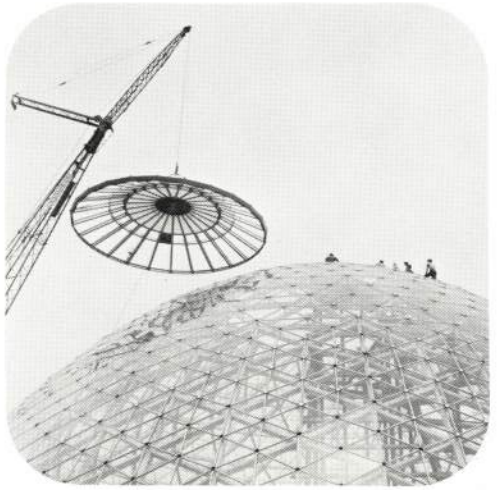


Specially constructed interior scaffold used by workmen for such jobs as installing the intermediate members, which were bolted in — not welded — because they must fit between the larger members. Special tools had to be custom-built to put the pieces together. Scaffold on the inside of dome, was mounted on 20 airplane tires, and revolves on a circular concrete pad.

Close-up showing hollow aluminum spheres to which tubular aluminum rafter bars are connected. Expansion and contraction due to thermo changes is taken up at each aluminum sphere.

CAPPING THE DOME

Three-ton apex dome (37 foot diameter) being lifted by crane. Note glass is NOT used at bottom of dome. This space was left for the catwalk structure to enable workmen to service the apex from the exterior. This dome cap, made of aluminum, stainless steel, and glass, is self-supported on the concrete ring at the top.

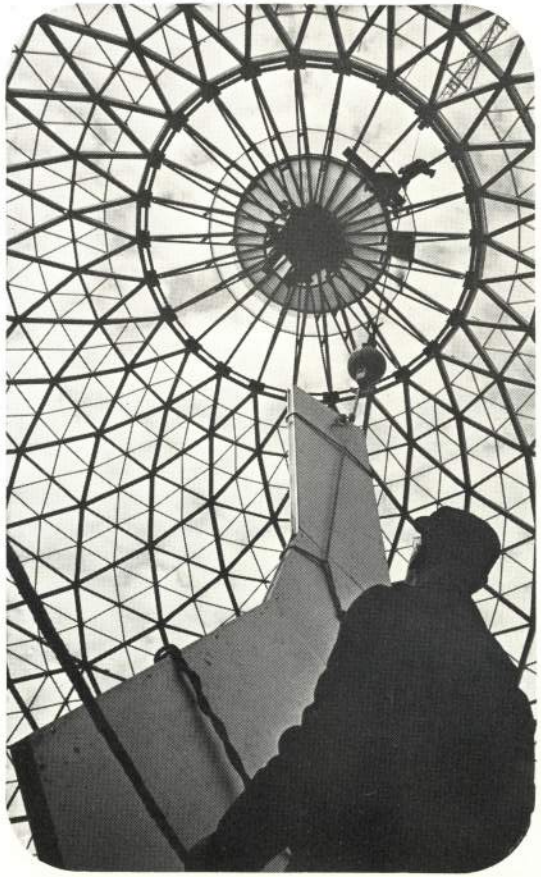


On the way up.

Eased over the opening. Note revolving scaffold at left.

Made it! Note how close boom is to concrete shell. Men on domeside had to relay their signals to the crane operator through another man on the boom.

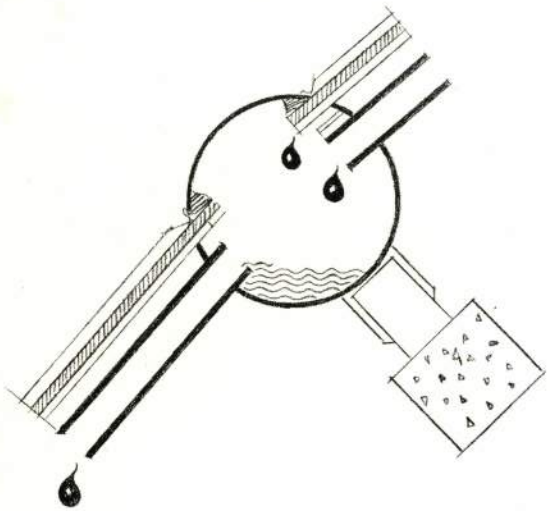
Scene from inside. Man is checking position of the apex dome.



Hoisting insulated aluminum panels, two inches thick, which cover the unglazed part of the apex dome. (Used to form structure for the exterior catwalk.)

A 20th CENTURY MARVEL . . . AND IT ALL WORKS!

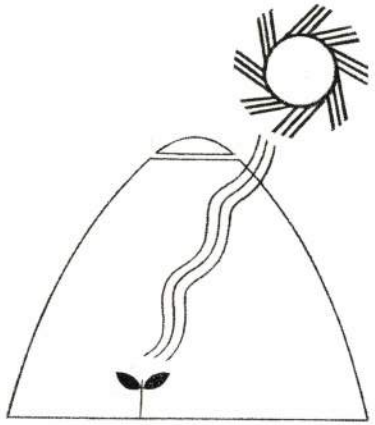
Visitors to Mitchell Park seldom realize why and how "everything works." Of the many unique operations involved, a few are described below:



NO UMBRELLAS NEEDED!

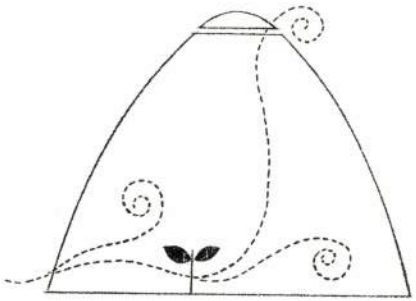
In some new conservatories, visitors on certain days are actually furnished umbrellas to keep the condensate from dripping on heads or hats. In the Mitchell Park domes, not one drop of moisture falls on visitors.

The reason is the ingenious design of the glazing system and the shape of the domes. Our glass is set in, and sealed with neoprene glazing strips. Condensation from the glass drains into and down the inside of the tubes, into the hollow aluminum spheres. Then gravity takes the moisture through the system of hollow aluminum rafter bars down through other spheres until it reaches the bottom of the dome.



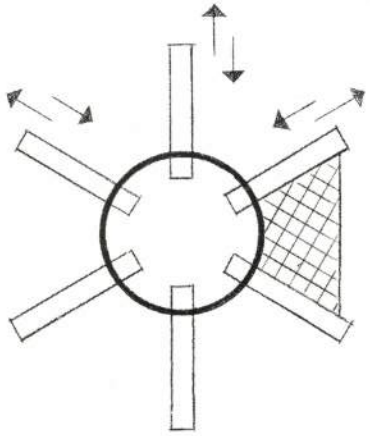
HOW DOES THE LIGHT KEEP PLANTS ALIVE?

Specifications called for a glass having close to 92% light transmission. The wide spectrum of color light rays are transmitted by the clear wire-embedded quarter-inch plate glass. "Photosynthesis" — the process of growth or transforming light energy into plants and flowers — required maximum amounts of light, especially in winter, to keep the plants alive.



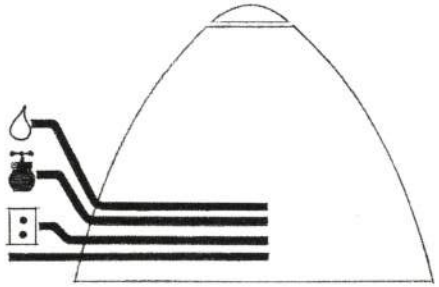
WHY DOESN'T SUMMER HEAT KILL THE PLANTS?

Because so much intense light enters the domes, you would think the heat generated would burn or kill the plants. This problem is solved in our domes by a stream of *fresh air* circulated by ten fans over the floors of the domes and also up and out the top. This air circulation dissipates any excessive heat and carries water vapors essential to the growth of the plants. No painted glass shading is needed.



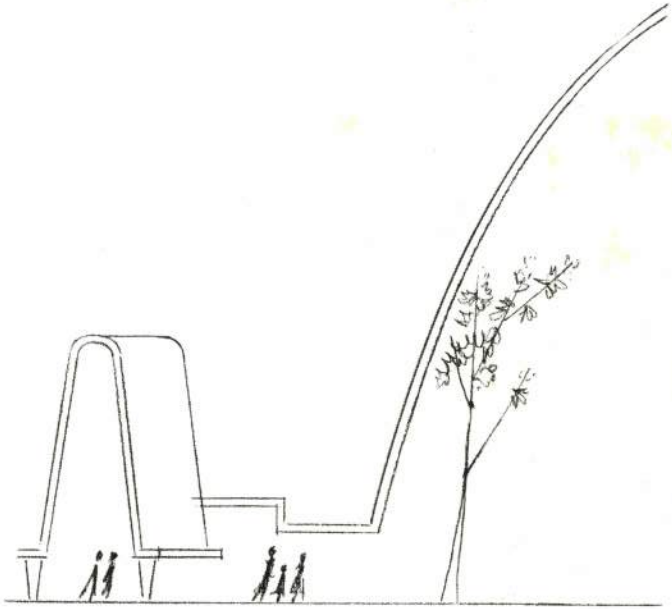
WHAT'S THE CLICKING SOUND WE HEAR ON COLD OR HOT DAYS?

This is the expansion or contraction of aluminum tubing in the hubs as it moves (up to a quarter inch) in each five foot member. Aluminum expands in hot weather, cools off quickly and shrinks in cold temperatures. All this movement was considered when designing the glass frame tube members.



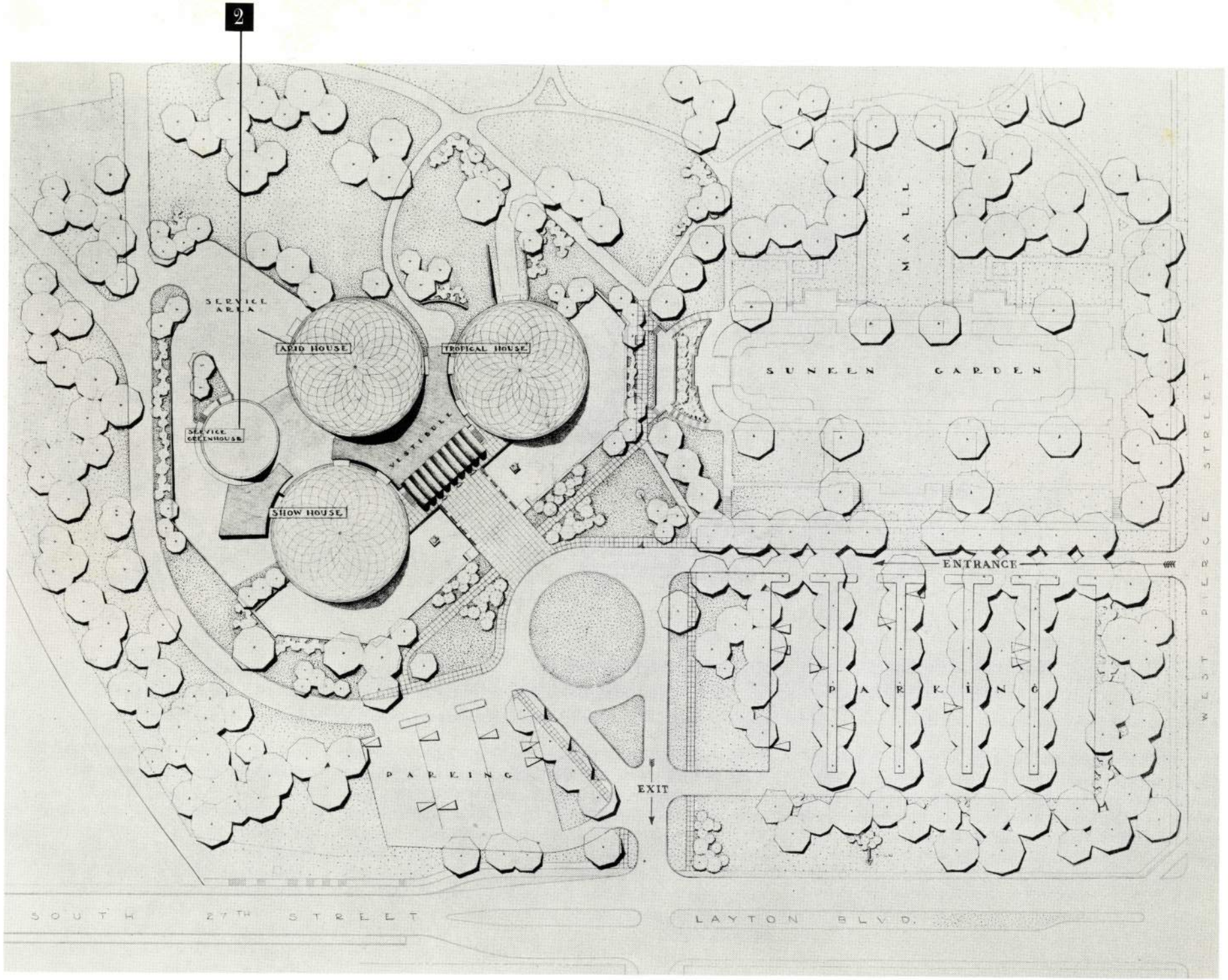
HOW IN THE WORLD IS THE "CLIMATE" CONTROLLED?

Each conoidal dome contains 750,000 cubic feet of space — enough to enclose 35 average-sized ranch homes if packed on top of each other! All this air can be completely changed in 3½ minutes. To scientifically heat, cool, humidify, and climate-condition the space, a complex assortment of pipes, acid water lines, heating fins, air ducts, electric wiring and controls, and vapor jets serve as the mechanical arteries. All are concealed in pipe tunnels surrounding the periphery of each dome.



WHAT CAUSES THE ILLUSION OF SO MUCH SPACE?

Visitors often gasp at the apparent tremendous amount of space inside. This is achieved by several design techniques using architectural shapes and varied ceiling heights. *Example:* You enter the 24-foot high arches of the vestibule, then immediately encounter the lowered foyer (8,000 square feet), which has only a nine foot ceiling. Then you walk through a still lower entry — only seven feet — and suddenly step into the space of the great conservatory domes. The result is a spacious explosion which gives you the feeling of being outdoors, breathing the fresh air and oxygen provided by the plant material within.


2
SERVICE AREA
ARID HOUSE
TROPICAL HOUSE
SERVICE GREENHOUSE
VESTIBULE
SHOW HOUSE
MALL
SUNKEN GARDEN
ENTRANCE
PARKING
EXIT
PARKING
WEST PIERCE STREET
SOUTH 27TH STREET
LAYTON BLVD.

SEVERAL PARTS MAKE UP THE WHOLE COMPLEX

Each component is a necessary part of the overall plan. Some are purely aesthetic, others purely functional; some combine both characteristics.

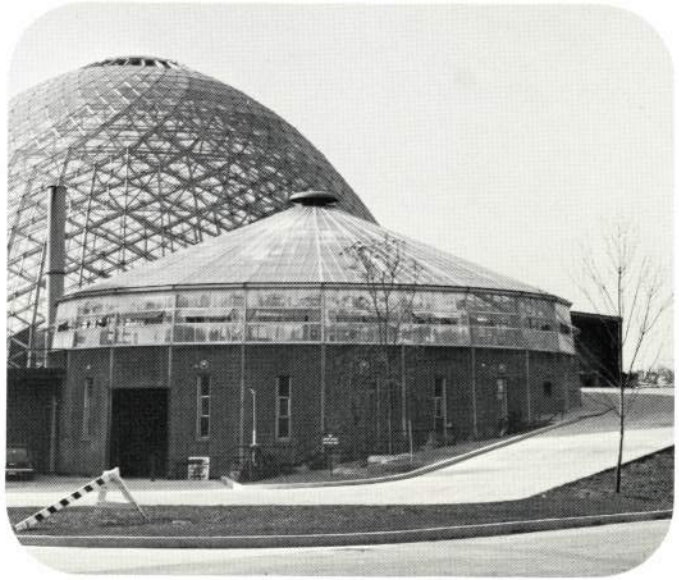
1 THE GREENHOUSE CENTER

(North 104th Street and Watertown Plank Road)

With its ten greenhouses, a complete laboratory, and a cold storage building, the Center is the working and growing site for much of the plant material displayed in Mitchell Park as well as for the annual plantings at all other Milwaukee County Parks, Mitchell Field (the County airport), and the Milwaukee County Zoological Park.

Propagation of plants for replacement is continuous. Plants are under 75,000 square feet of glass at the Greenhouse Center, where scheduling is on a long-term basis. Many plants, for instance, are grown from seeds sown here two years in advance of the show which will feature them.

The spectacular shows at the Conservatory in Mitchell Park are made possible only by the hard work and attention to detail that typifies the operation of the Greenhouse Center.



2 THE TRANSITION HOUSE

This circular greenhouse is located immediately adjacent to the Show House. Its function is to store and renovate plant materials used in specific shows, and to store plants for future shows. Automatic movement of air in the Transition House is similar to the circulation in the domes. Careful planning has resulted in a trouble-free two-way flow of transitional plant material between the Transition House and the Show House.

3 THE SHOW HOUSE *(Blue entrance)*

Among the major shows Milwaukeeans and tourists anticipate are the Orchid, Easter, Mother's Day, Summer, Exotic Plant Clinic, Chrysanthemum, and Christmas.

4 THE ARID HOUSE *(Yellow entrance)*

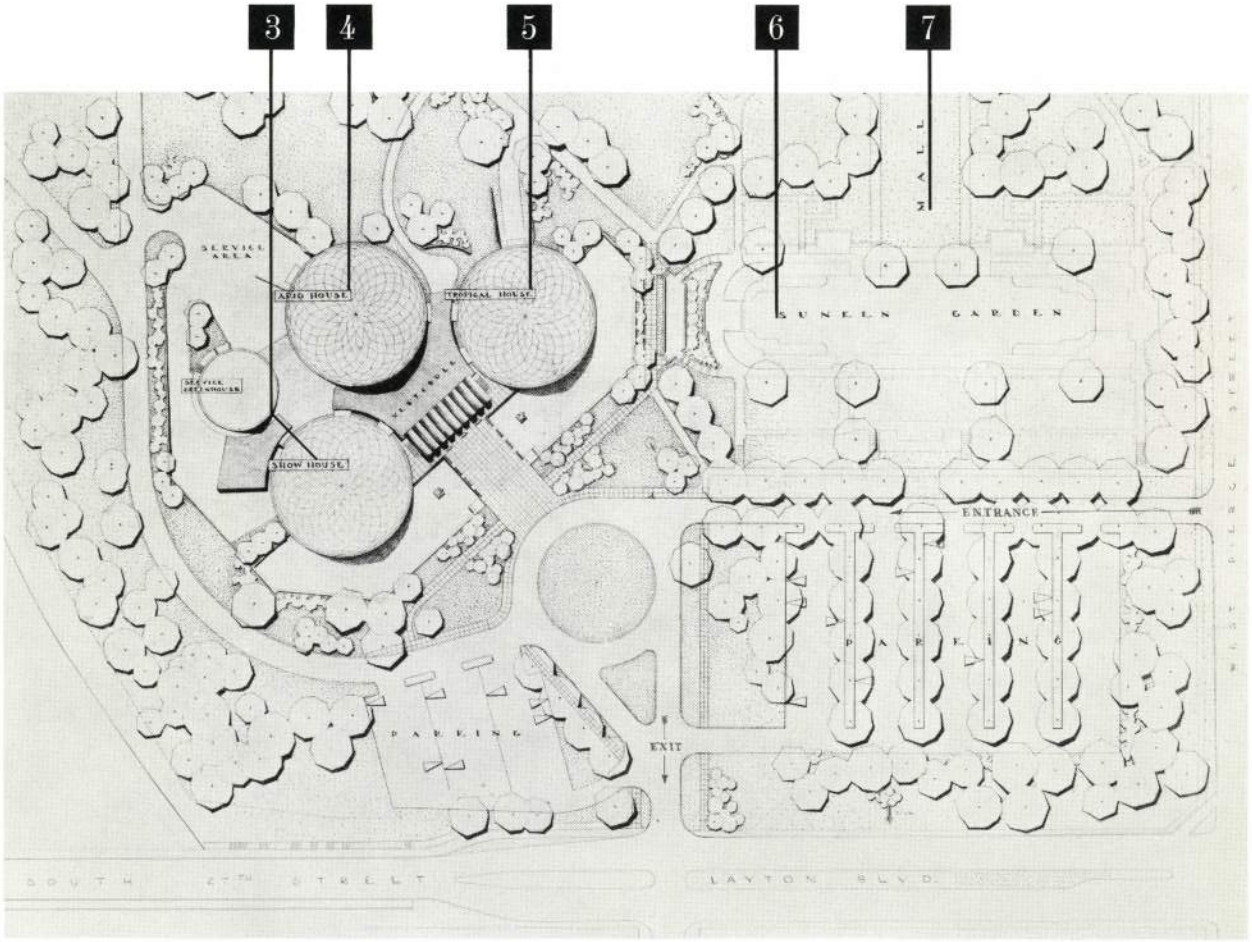
Amidst a setting of man-made rock that closely simulates the appearance of the southwest U.S. desert, this dome includes cacti and succulent plants from the world's deserts, acacia trees, and an "oasis" featuring Washingtonia Palms and typical desert plants. At the base of the beautiful stonework are desert blooming flowers.

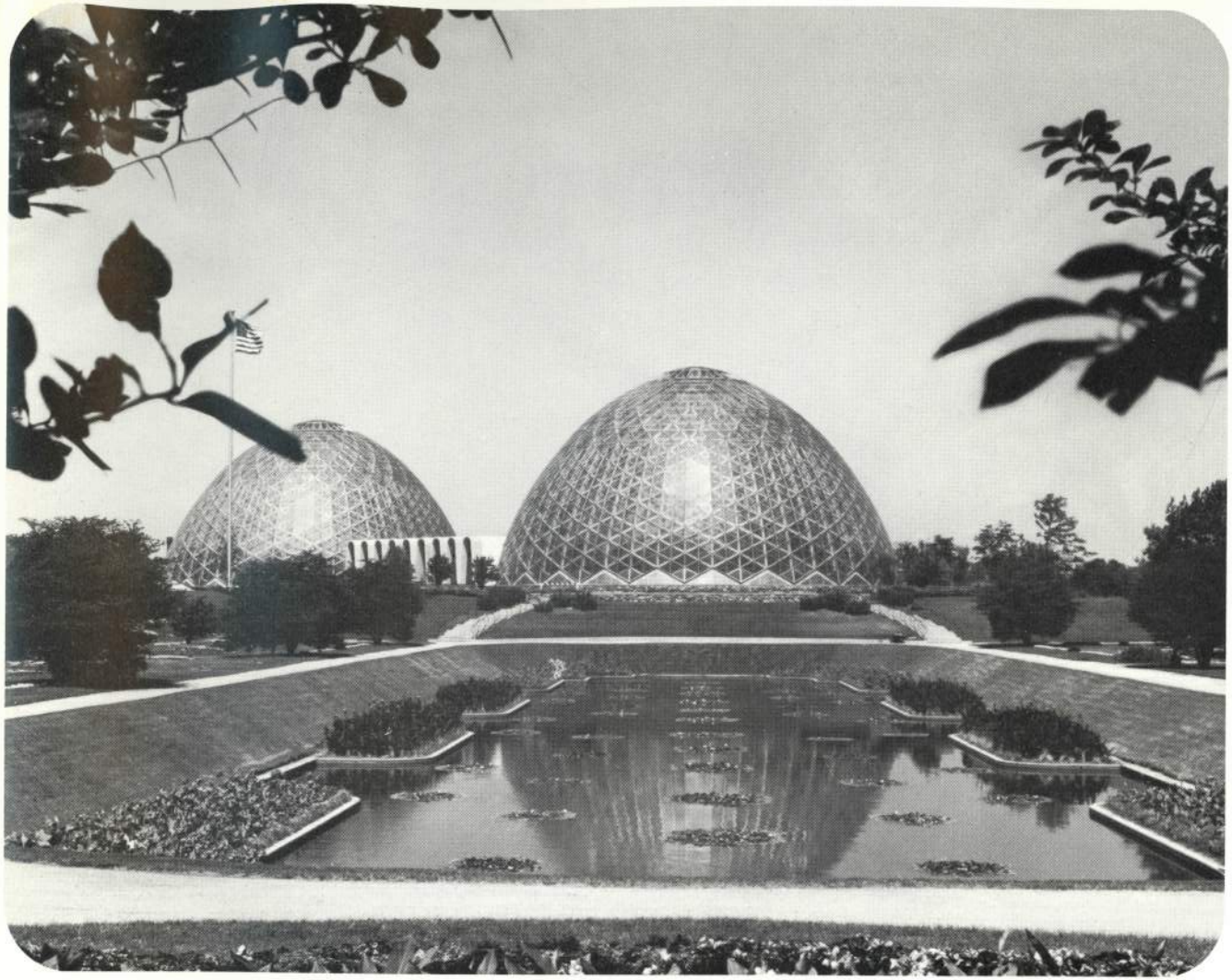
5 THE TROPICAL HOUSE *(Green entrance)*

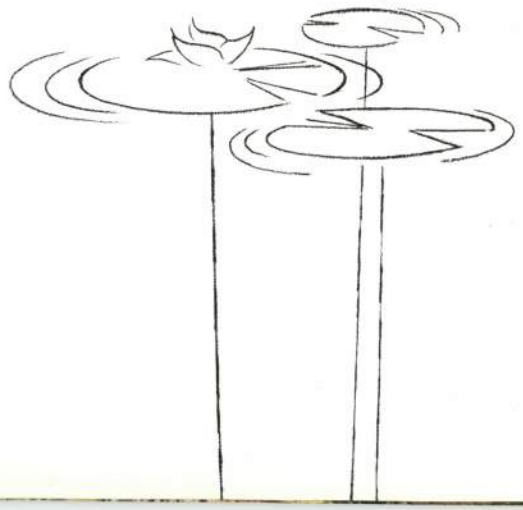
A dramatic 25-foot waterfall and recirculating water pool at the base are highlights of the authentic equatorial atmosphere in this dome. Against a backdrop of man-made rock, this lush tropical jungle includes a most realistic growth arrangement. Palms 70 feet high, and tall majestic shrubs provide a natural shade for delicate ferns and orchids far below. At the second level are foliage and "economic" plants (citrus, papaya, etc.). And at ground level are vines, shrubs, and tropical ground flowers protected from heat as well as light by the towering palms and high plants.

Aeroid root plants grow in healthy profusion on the tree trunks, where orchids also bloom. In the pool, instead of crocodiles, are handsome water lilies, which also enhance the shoreline.

(In the future, the tropic magnificence here will be enlivened with bird sounds — either live or taped.)







6 THE SUNKEN GARDENS

Familiar to Conservatory visitors for years, this lovely area south of the buildings features old-world formal gardens in the French parterre design. Although internal designs change, the border contours of the planting beds do not.

7 THE ROSE MALL

Adjacent to the Sunken Garden to the east, the Rose Mall features a dazzling seasonal display of 2,000 rose plants. This old-fashioned garden with its perennial borders on the north and south forms a quaint but eloquent contrast to the jet-age domes.

THE SUBSTRUCTURE

(not shown on map)

Housed beneath the mighty domes is an enormous but spotless array of the most modern equipment available for the control of natural growth in the various units. Most of the machinery and control apparatus is Wisconsin-built; some of it was made to the custom specifications of the Conservatory. Included are:

An automatic electric generator.

Three gas-fired boilers (with oil conversion equipment for emergencies), plus space for another.

An acid treatment system for water, including two 18,000 gallon tanks for storage.

Three compressors for the humidification system.

FACTS AND FIGURES

(This miscellany includes some of the questions commonly asked by visitors to Mitchell Park, with the answers; and other interesting data.)

How much glass is in the three domes?

115,000 square feet. Put together in a ten foot strip, this would make a glass road more than two **miles** long!

How much neoprene gasketing is used?

240,000 feet. This is 45 miles — enough to make a connection between Milwaukee and Sheboygan — without stretching.

How many spherical aluminum hubs?

5,500 hubs eight inches in diameter. These would completely cover the floor of a gymnasium 80 feet long and 45 feet wide.

How many feet of extruded aluminum?

120,000 feet. Piled end on end, this would make a flagpole extending nearly 23 **miles** into the sky.

What supports the big domes?

Each of the huge domes, 140 feet in diameter and nearly 80 feet high, is entirely self-supporting. There are no columns interfering with the feeling of spaciousness. As explained earlier in this book, it is the thin, light concrete frame which supports the glass and aluminum skin.

What is the humidity in the domes?

Depending on requirements, humidity in the three domes can range between 25% and 100%. Year 'round humidities for each dome, with a temperature of about 75°, are: Show House, 75%; Tropical House, 85%; Arid House, 35%.

How are the domes heated?

Gas-fired boilers send steam through the fin tubing around the periphery of the domes. In addition, fresh air brought in through triangular vents at the base of the domes is heated, then distributed to the interior.

What is the total weight of the glass and aluminum skin?

337½ tons — more than 100 tons for each dome. (A medium size American car weighs about a ton and a half.)

What kind of glass is used?

One quarter-inch thick plate glass, polished both sides, and reinforced by welded wire netting.

How many pieces of glass were used?

9,438. This is enough glass to be used in windows for 450 average size ranch houses.

How is the glass serviced?

From the outside. An electric scaffold has a wire cable which hooks to a ring at the dome apex. The electric motor winds the cable up the scaffolding, easily carrying two men and equipment for washing or replacing glass or neoprene seals.

How were the big entry arches erected?

Main entry arches, built of six inch precast concrete, were poured on the ground, then lifted by a crane into position in halves. Each arch is 24 feet high.

How warm is the water supplied to the plants?

It is controlled at a 80° F.

Is the concrete frame painted?

All four sides of the concrete sections have two coats of a special epoxy paint which is resistant to fungi and chemicals that could damage the plants.

How much space is between the glass skin and the concrete frame?

Six to eight inches of space separates the two, permitting the necessary air circulation. It also provides space for future repainting of the concrete members.

What is the exterior surface of the arches?

The outside is surfaced with a quartz-like stone. Gold anodized aluminum grilles keep out hot rays of the sun, and shelter the glass openings in summer.

Who dedicated the new domes — and when?

The First Lady of our country, Mrs. Lyndon B. Johnson, formally dedicated the new Conservatory structures on September 23, 1965.

How much did the project cost?

The total expenditure through 1965 was $4,168,000. Beginning with the demolition of the old Conservatory in 1955, appropriations for the new domes were made every year through 1965 (except 1958). As the money was appropriated, construction continued. The largest appropriation was made in 1962 ($1,260,000); the smallest in 1959 ($90,000).

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